

Year 12 Maths Preview Sheet

Exam Board: Edexcel

Syllabus: 9MA0

Module 1

Pure Maths

Algebraic Expressions (Pages 1 – 17)

- Index laws
- Expanding brackets
- Factorising
- Negative and fractional indices
- Surds
- Rationalising the denominator

Sequences and Series (Pages 18 – 37)

- Solving quadratic equations
- Completing the square
- Functions
- Quadratic graphs
- The discriminant
- Modelling with quadratics

Equations and Inequalities (Pages 38 – 58)

- Linear simultaneous equations
- Quadratic simultaneous equations
- Simultaneous equations on graphs
- Linear inequalities
- Quadratic inequalities
- Inequalities on graphs
- Regions

Graphs and Transformations (Pages 59 – 88)

- Cubic graphs
- Quartic graphs
- Reciprocal graphs
- Points of intersection
- Translating graphs
- Stretching graphs
- Transforming functions

Statistics

Data Collection (Pages 1 – 19)

- Population and samples
- Sampling
- Non-random sampling
- Types of data
- The large data set

Measures of Location and Spread (Pages 20 – 39)

- Measures of central tendency
- Other measures of location
- Measures of spread
- Variance and standard deviation
- Coding

Representation of Data (Pages 40 – 58)

- Outliers
- Box plots
- Cumulative frequency
- Histograms
- Comparing data

Correlation (Pages 59 – 68)

- Correlation
- Linear regression

Module 2

Pure Maths

Straight Line Graphs (Pages 89 – 112)

- $y = mx + c$
- Equations of straight lines
- Parallel and perpendicular lines
- Length and area
- Modelling with straight lines

Circles (Pages 113 – 136)

- Midpoints and perpendicular bisectors
- Equation of a circle
- Intersections of straight lines and circles
- Using tangent and chord properties
- Circles and triangles

Algebraic Methods (Pages 137 – 157)

- Algebraic fractions
- Dividing polynomial
- The factor theorem
- Mathematical proof
- Methods of proof

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Statistics

Probability (Pages 69 – 82)

- Calculating probabilities
- Venn diagrams
- Mutually exclusive and independent events
- Tree diagrams

Statistical Distributions (Pages 83 – 97)

- Probability distributions
- The binomial distribution
- Cumulative probabilities
- Hypothesis Testing (Pages 98 – 112)
- Hypothesis testing
- Finding critical values
- One-tailed test
- Two tailed test

Module 3

Pure Maths

The Binomial Expansion (Pages 158 – 172)

- Pascal's triangle
- Factorial notation
- The binomial expansion
- Solving binomial problems
- Binomial estimates

Trigonometric Ratios (Pages 173 – 201)

- The cosine rule
- The sine rule
- Areas of triangles
- Solving triangle problems
- Graphs of sine, cosine and tangent
- Transforming trigonometric graphs

Trigonometric Identities and Equations (Pages 202 – 225)

- Angles in all four quadrants
- Exact values of trigonometric ratios
- Trigonometric identities
- Simple trigonometric equations
- Harder trigonometric equations
- Equations and identities

Mechanics

Modelling in Mechanics (Pages 118 – 129)

- Constructing a model
- Modelling assumptions
- Quantities and units
- Working with vectors

Constant Acceleration (Pages 130 – 155)

- Displacement-time graphs
- Velocity-time graphs
- Constant acceleration formulae
- Vertical motion under gravity

Module 4

Pure Maths

Vectors (Pages 230 – 254)

- Vectors
- Representing vectors
- Magnitude and direction
- Position vectors
- Solving geometric problems
- Modelling with vectors

Differentiation (Pages 255 – 286)

- Gradients of curves
- Finding the derivative
- Differentiation of x^n
- Differentiating quadratics
- Differentiating functions with two or more terms
- Gradients, tangents and normals
- Increasing and decreasing functions
- Second order derivatives
- Sketching functions
- Modelling with differentiation

Integration (Pages 287 – 310)

- Integrating x^n
- Indefinite integrals
- Finding functions
- Definite integrals
- Area under curves
- Area under the x-axis
- Area between curves and lines

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Mechanics

Forces and Motion (Pages 156 – 180)

- Force diagrams
- Forces as vectors
- Forces and acceleration
- Motion in 2 dimensions
- Connected particles
- Pulleys

Variable Acceleration (Pages 181 – 200)

- Functions of time
- Using differentiation
- Maxima and minima problems
- Using integration
- Constant acceleration formulae

Module 5

Pure Maths

Exponentials and logarithms (Pages 311 – 337)

- Exponential functions
- $y = e^x$
- Exponential modelling
- Logarithms
- Laws of logarithms
- Solving equations using logarithms
- Working with natural logarithms
- Logarithms and non-linear data

Revision of the year